

## **Claims**

What is claimed is:

1. A method comprising steps of:

acquiring one of a plurality of immersive video frames at a first location, said one of  
said plurality of immersive video frames a portion of an immersive video;

packing said one of said plurality of immersive video frames into at least one  
standard television video frame; and

sending, from said first location, said at least one standard television video frame  
capable of being received at a second location using a television signal transmission  
mechanism.

2. A method comprising steps of:

acquiring one of a plurality of immersive video frames at a first location, wherein  
said one of said plurality of immersive video frames contains a warped representation of  
a scene and is a portion of an immersive video;

packing said one of said plurality of immersive video frames into at least one  
standard television video frame;

sending, from said first location, said at least one standard television video frame to  
a second location using a television signal transmission mechanism;

receiving, by a television signal receiver mechanism at said second location, said at  
least one standard television video frame;

unwarping a portion of said at least one standard television video frame into a view;  
and

presenting said view.

3. A method comprising steps of:

receiving at least one standard television video frame containing one of a plurality  
of immersive video frames, by a television signal receiver mechanism;

unwarping a portion of said at least one standard television video frame into a view;  
and

presenting said view.

4. The method of claims 1 or 2 wherein the steps of acquiring, packing, and sending are  
repeated with a second one of said plurality of immersive video frames.

5. The method of claim 1 further comprising receiving said at least one standard television  
video frame by a television signal receiver mechanism at said second location.

6. The method of claim 5 further comprising steps of:

unwarping a portion of said at least one standard television video frame into a view;  
and

presenting said view.

7. The method of claims 1 or 2 wherein the step of packing comprises steps of:

unwrapping an annular image contained within said one of said plurality of  
immersive video frames; and

scaling said unwrapped annular image to fit within said at least one standard  
television video frame.

8. The method of claim 1 wherein said one of said plurality of immersive video frames  
contains a warped representation of a scene.

9. The method of claims 2 or 8 wherein said warped representation results from capturing  
said scene through a catadioptric lens.

10. The method of claims 2 or 8 wherein said warped representation results from capturing  
said scene through at least one wide-angle lens.

11. The method of claims 2 or 8 wherein said warped representation results from capturing  
said scene through at least one fish-eye lens.

12. The method of claims 2, 3 or 6 wherein the step of presenting comprises a step of recording said view on a videotape, a disk, an optical film or other tangible recording media.

13. The method of claims 2, 3 or 6 wherein the step of presenting comprises a step of displaying said view on a television, a computer monitor, or on a tangible media.

14. The method of claims 2, 3 or 6 further comprising steps of:

reconstructing said one of said plurality of immersive video frames from said at least one standard television video frame;

compressing said one of said plurality of immersive video frames into a compressed frame;

storing said compressed frame in a server computer; and

serving said compressed frame from said server computer to a client device;

wherein the step of unwarping is performed at said client device.

15. The method of claim 14 wherein said client device is selected from the group consisting of a client computer, a television receiver, a video conferencing receiver, a personal organizer, a set-top-box, and an entertainment system.

16. The method of claim 14 wherein the step of serving sends said compressed frame to said client device using a transmission mechanism selected from the group consisting of a microwave link, a television cable system, a direct subscriber line (DSL) system, a satellite communication system, a fiber communication system, an Internet, a digital television system, an analog television system, a wire system and a wireless system.

17. The method of claims 1 or 2 wherein the step of packing further comprises steps of:

apportioning said one of said plurality of immersive video frames into a plurality of portions;

scaling one or more of said plurality of portions; and

storing each of said scaled plurality of portions in one of said at least one standard television video frame.

18. The method of claims 1 or 2 wherein the step of packing further comprises steps of:  
tagging said first of said at least one standard television video frame as a first partial  
frame; and

tagging said second of said at least one standard television video frame as a second  
partial frame.

19. The method of claim 18 further comprising steps of:

mapping a first portion of said one of said plurality of immersive video frames into  
a first of said at least one standard television video frame; and

mapping a second portion of said one of said plurality of immersive video frames  
into a second of said at least one standard television video frame.

20. The method of claims 1 or 2 wherein the step of acquiring acquires said plurality of  
immersive video frames from a digital video camera, an analog video camera in  
communication with a digitizer, a video playback device, or a computer.

21. An apparatus comprising:

an acquisition mechanism configured to acquire one of a plurality of immersive  
video frames at a first location, said one of said plurality of immersive video frames a  
portion of an immersive video;

a packing mechanism configured to pack said one of said plurality of immersive  
video frames received by the acquisition mechanism into at least one standard television  
video frame; and

a sending mechanism configured to send, from said first location, said at least one  
standard television video frame capable of being received at a second location using a  
television signal transmission mechanism, said at least one standard television video  
frame packed by the packing mechanism.

22. A system comprising:

an acquisition mechanism configured to acquire one of a plurality of immersive  
video frames at a first location, wherein said one of said plurality of immersive video

frames contains a warped representation of a scene and is a portion of an immersive video;

a packing mechanism configured to pack said one of said plurality of immersive video frames acquired by the acquisition mechanism into at least one standard television video frame;

a sending mechanism configured to send from said first location, said at least one standard television video frame to a second location using a television signal transmission mechanism, said at least one standard television video frame responsive to the packing mechanism;

a television signal receiver mechanism at said second location configured to receive said at least one standard television video frame sent by the sending mechanism;

a transformation mechanism configured to unwarp a portion of said at least one standard television video frame received by the television signal receiver mechanism into a view; and

a presentation mechanism configured to present said view as transformed by the transformation mechanism.

23. An apparatus comprising:

a television signal receiver mechanism configured to receive at least one standard television video frame containing one of a plurality of immersive video frames;

a transformation mechanism configured to unwarp a portion of said at least one standard television video frame received by the television signal receiver mechanism into a view; and

a presentation mechanism configured to present said view as transformed by the transformation mechanism.

24. The apparatus of claims 21 or 22 wherein the packing mechanism further comprises:

a mapping mechanism configured to map an annular image contained within said one of said plurality of immersive video frames; and

a scaling mechanism configured to scale said mapped annular image to fit within said at least one standard television video frame.

25. The apparatus of claim 21 wherein said one of said plurality of immersive video frames contains a warped representation of a scene.

26. The apparatus of claims 22 or 25 wherein said warped representation results from capturing said scene through a catadioptric lens.

27. The apparatus of claims 22 or 25 wherein said warped representation results from capturing said scene through at least one wide-angle lens.

28. The apparatus of claims 22 or 25 wherein said warped representation results from capturing said scene through at least one fish-eye lens.

29. The apparatus of claims 22 or 23 wherein the presentation mechanism comprises a recording mechanism configured to record said view on a videotape, a disk, an optical film or other tangible recording media.

30. The apparatus of claims 22 or 23 wherein the presentation mechanism comprises a display mechanism configured to display said view on a television, a computer monitor, or on a tangible media.

31. The apparatus of claims 22 or 23 further comprising:

a reconstruction mechanism configured to reconstruct said one of said plurality of immersive video frames from said at least one standard television video frame;

a compression mechanism configured to compress said one of said plurality of immersive video frames into a compressed frame;

a storage mechanism configured to store said compressed frame in a server computer; and

a server mechanism configured to serve said compressed frame from said server computer to a client device;

wherein the transformation mechanism is located at said client device.

32. The apparatus of claim 31 wherein said client device is selected from the group consisting of a client computer, a television receiver, a video conferencing receiver, a personal organizer, a set-top-box, and an entertainment system.
33. The apparatus of claim 31 wherein the server mechanism is configured to send said compressed frame to said client device using a transmission mechanism selected from the group consisting of a microwave link, a television cable system, a direct subscriber line (DSL) system, a satellite communication system, a fiber communication system, an Internet, a digital television system, an analog television system, a wire system and a wireless system.
34. The apparatus of claims 21 or 22 wherein the packing mechanism further comprises:
- an apportionment mechanism configured to apportion said one of said plurality of immersive video frames into a plurality of portions;
  - a scaling mechanism, responsive to the apportionment mechanism, configured to scale one or more of said plurality of portions; and
  - a portion storage mechanism configured to store each of said scaled plurality of portions in one of said at least one standard television video frame.
35. The apparatus of claims 21 or 22 wherein the packing mechanism further comprises:
- a tag mechanism configured to tag said first of said at least one standard television video frame as a first partial frame and said second of said at least one standard television video frame as a second partial frame.
36. The apparatus of claim 35 further comprising:
- a mapping mechanism configured to map a first portion of said one of said plurality of immersive video frames into a first of said at least one standard television video frame and a second portion of said one of said plurality of immersive video frames into a second of said at least one standard television video frame.
37. The apparatus of claims 21 or 22 wherein the acquisition mechanism acquires said plurality of immersive video frames from a digital video camera, an analog video camera in communication with a digitizer, a video playback device, or a computer.

38. A computer program product comprising:

a computer usable data carrier having computer readable code embodied therein for causing a computer to send one of a plurality of immersive video frames, said computer readable code comprising:

computer readable program code configured to cause said computer to effect a packing mechanism configured to pack said one of said plurality of immersive video frames capable of being received by an acquisition mechanism at a first location into at least one standard television video frame, said one of said plurality of immersive video frames a portion of an immersive video; and

computer readable program code configured to cause said computer to effect a sending mechanism configured to send, from said first location, said at least one standard television video frame capable of being received at a second location using a television signal transmission mechanism, said at least one standard television video frame packed by the packing mechanism.

39. The computer program product of claim 38 wherein the packing mechanism further comprises:

computer readable program code configured to cause said computer to effect a mapping mechanism configured to unwrap an annular image contained within said one of said plurality of immersive video frames; and

computer readable program code configured to cause said computer to effect a scaling mechanism configured to scale said unwrapped annular image to fit within said at least one standard television video frame.

40. The computer program product of claim 38 wherein the packing mechanism further comprises:

computer readable program code configured to cause said computer to effect an apportionment mechanism configured to apportion said one of said plurality of immersive video frames into a plurality of portions;



computer readable program code configured to cause said computer to effect a scaling mechanism, responsive to the apportionment mechanism, configured to scale one or more of said plurality of portions; and

computer readable program code configured to cause said computer to effect a portion storage mechanism configured to store each of said scaled plurality of portions in one of said at least one standard television video frame.

41. The computer program product of claim 38 wherein the packing mechanism further comprises computer readable program code configured to cause said computer to effect a tag mechanism configured to tag said first of said at least one standard television video frame as a first partial frame and said second of said at least one standard television video frame as a second partial frame.
42. The computer program product of claim 41 further comprising computer readable program code configured to cause said computer to effect a mapping mechanism configured to map a first portion of said one of said plurality of immersive video frames into a first of said at least one standard television video frame and a second portion of said one of said plurality of immersive video frames into a second of said at least one standard television video frame.
43. The computer program product of claim 38 wherein the acquisition mechanism is capable of acquiring said plurality of immersive video frames from a digital video camera, an analog video camera in communication with a digitizer, a video playback device, or a computer.
44. The computer program product of claim 38 wherein said one of said plurality of immersive video frames contains a warped representation of a scene.
45. The computer program product of claim 44 wherein said warped representation results from capturing said scene through a catadioptric lens.
46. The computer program product of claim or 44 wherein said warped representation results from capturing said scene through at least one wide-angle lens.

47. The computer program product of claims 44 wherein said warped representation results from capturing said scene through at least one fish-eye lens.

48. A computer program product comprising:

a computer usable data carrier having computer readable code embodied therein for causing a computer to present one of a plurality of immersive video frames, said computer readable code comprising:

computer readable program code configured to cause said computer to effect a transformation mechanism configured to unwarp a portion of said one of said plurality of immersive video frames contained in at least one standard television video frame received by a television signal receiver mechanism into a view, said at least one standard television video frame, containing one of said plurality of immersive video frames; and

computer readable program code configured to cause said computer to effect a presentation mechanism configured to present said view as transformed by the transformation mechanism.

49. The computer program product of claim 48 wherein the presentation mechanism comprises computer readable program code configured to cause said computer to effect a recording mechanism configured to record said view on a videotape, a disk, an optical film or other tangible recording media.

50. The computer program product of claim 48 wherein the presentation mechanism comprises computer readable program code configured to cause said computer to effect a display mechanism configured to display said view on a television, a computer monitor, or on a tangible media.

51. The computer program product of claim 48 further comprising:

computer readable program code configured to cause said computer to effect a reconstruction mechanism configured to reconstruct said one of said plurality of immersive video frames from said at least one standard television video frame;

computer readable program code configured to cause said computer to effect a compression mechanism configured to compress said one of said plurality of immersive video frames into a compressed frame;

computer readable program code configured to cause said computer to effect a storage mechanism configured to store said compressed frame in a server computer; and

computer readable program code configured to cause said computer to effect a server mechanism configured to serve said compressed frame from said server computer to a client device;

wherein the transformation mechanism is located at said client device.

52. The computer program product of claim 51 wherein said client device is selected from the group consisting of a client computer, a television receiver, a video conferencing receiver, a personal organizer, a set-top-box, and an entertainment system.
53. The computer program product of claim 51 wherein the server mechanism is configured to send said compressed frame to said client device using a transmission mechanism selected from the group consisting of a microwave link, a television cable system, a direct subscriber line (DSL) system, a satellite communication system, a fiber communication system, an Internet, a digital television system, an analog television system, a wire system and a wireless system.
54. A computer program product comprising of claims 38 or 48 wherein the computer usable data carrier is a computer readable media.
55. A computer program product comprising of claims 38 or 48 wherein the computer usable data carrier is a carrier wave.